California Regional Water Quality Control Board
San Diego Region
Revised Project Application Form

Name of Project: San Luis Rey Watershed Non-Native Plant Control Project
Project Applicant: Mission Resource Conservation District
Applicant Contact Person: Judith Mitchell, District Manager
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Problem Statement:

No invasive non-native plant has the ability to alter and degrade biotic and abiotic processes to the magnitude that *Arundo donax* (giant reed) can. It alters hydrology, geomorphology, fluvial processes, fire, habitat, and biological function, driving riparian systems toward *Arundo* dominated systems with limited value to native plants and animals, including many listed species. Fire impacts also reach uplands as *Arundo* conveys fire across and down rivers. The Santa Margarita and San Luis Rey Watersheds were the two most invaded watersheds in the County - they are now over 90% *Arundo* free. Funding is needed to continue re-treatments of Arundo so that the goal of 100% eradication within the San Luis Rey watershed is obtained. State and Federal funders infrequently fund re-treatments (viewed as O&M), but this is a critical component of the program.

The *Arundo* control program for the San Luis Rey and Santa Margarita watersheds has been operating since 1994. The program has completed initial treatments on over 95% of San Luis Rey using predominantly State and Federal grant funds. For watershed based *Arundo* eradication programs to be successful, long term re-treatments must occur. State and Federal funders typically only fund initial control and re-vegetation work. Local programs are vital in providing funding for re-treatment efforts to make these watershed based programs successful over the long term. Re-treatment funding has been secured in the past through the San Diego Association of Governments TransNet Environmental Mitigation Program; however, there is an ongoing need for re-treatment funds

In addition to *Arundo*, several species of on-native woody vegetation have similar impacts to biotic and abiotic processes. Species such as Tamarisk spp. (saltcedar), Ailanthus altissima (tree of heaven), *Eucalyptus spp*., and *Acacia spp*., have the ability to alter hydrology, biological function, and fluvial processes. According to the California Invasive Plant Council, saltcedar has

> very high water use and increased deposition of salts on soil surface. The longer the community has been invaded by saltcedar the more xeric in nature are the plant species which occupy the understory. Such deposits of salt-encrusted needles can inhibit other species germination. Saltcedar has been blamed for increasing flooding by forming a partial barrier to floodflow, which can cause floodwater to disperse and inundate areas that otherwise would not be flooded. With the invasion of saltcedar there has been an apparent increase in the frequency of fire in riparian ecosystems. Evapotranspiration rates of saltcedar are among the highest of any phreatophyte evaluated in southwestern North America, including native riparian trees. Saltcedar has been reported to contain 41,000 ppm dissolved solids in the guttation sap (http://www.cal-ipc.org/paf/site/paf/438).

The program has active regulatory permits, current right of entry agreements (ROEs) for over 350 properties, and continues to secure other funding to complete initial treatments of woody non-native species and *Arundo* within the San Luis Rey watershed. The project promotes the restoration of aquatic ecosystems in the San Diego Region and furthers the recovery of streams, wetlands, and riparian systems.

The following Project Attributes are applicable to this Program:

1. Does this project directly contribute to water quality objectives and/or beneficial uses?

Yes, the removal of non-native species from the watershed directly contributes to the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation given to the lower San Luis Rey River.

2. Does the project propose measureable environmental outcomes?

Yes, the project will provide measurable environmental outcomes in terms of non-native vegetation removed (acres, treatment points).

3. Does the project demonstrate sustained longevity of environmental outcomes?

Yes, the project demonstrates sustained longevity of environmental outcomes. The District has been operating the Santa Margarita San Luis Rey Weed Management Area since the 1990s and has been successful in removing roughly 95% of *Arundo donax* from the San Luis Rey Watershed. Re-treatments of *Arundo* will ensure that the watershed does not become re-infested. The treatment of tamarisk and other woody non-native vegetation will also be sustained in the long term as the District continues to seek funding for watershed wide work.

4. Is the project part of a larger vetted, adopted, or established plan with support from multiple diverse partners?

Yes, the project is part of a larger plan and has the support of multiple partners. Several statewide and regional plans note the importance of eradicating *Arundo* and other non-native vegetation from the San Luis Rey Watershed, including: San Diego NCCP Plans: San Diego MSCP, San Diego HCP, Northern San Diego HCP and San Diego Management and Monitoring Program Strategic Plans, he South Coast Steelhead Recovery Plan (2012), Riparian Habitat Joint Venture Riparian Bird Conservation Plan (2004), The State Wildlife Action Plan (2005), The California Water Action Plan (2014), and Integrated Regional Water Management Plan (2013) for the San Diego County region. In addition, past large scale invasive control projects carried out by the District have received support from the California Invasive Plant Council, Wildlife Conservation Board, Fallbrook Public Utilities District, California Department of Transportation, California Native Plant Society, San Diego County Water Authority, and US Fish and Wildlife Service, among others.

5. Does the project improve conditions for a 303(d) limited segment or preserve conditions in a high quality water body?

Yes, the project will improve conditions for the San Luis Rey River, which is a 303(d) listed segment (upper and lower). *Arundo* stands are characterized by shallow rhizomatous root systems that are prone to undercutting and fragmentation. This material is dispersed downstream and is the primary source for new infestations. Bank failure contributes to localized erosion and decreased water quality.

6. Does the project improve a designated priority listed in a Water Quality Improvement Plan?

Yes, the San Luis Rey Watershed Management Area WQIP lists the Index of Biotic Integrity as a Priority Water Quality Condition. Please see above (Q5), as to how this project will improve the IBI.

7. Does the project improve conditions of a key beneficial use category in a key area?

Yes, the removal of non-native species from the watershed directly contributes to the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation given to the lower San Luis Rey River.

8. Does the project address the source of the problem at/near the source of the problem?
Yes, the project will systematically treat non-native vegetation directly.
9. Does the project address problems to sensitive/vulnerable/rare places/waters/uses?
Yes, the project seeks to improve habitat conditions within the San Luis Rey Watershed. The project area is home to several listed species and is designated critical habitat for species including (but not limited to): heart-leaved pitcher sage (*Lepechinia cardiophylla*), Orcutt's brodiaea (*Brodiaea orcuttii*), Parry's tetracoccus (*Tetracoccus dioicus*), thread-leaved brodiaea (*Brodiaea filifolia*), southwestern willow flycatcher (*Empidonax traillii extimus*), and coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis), and* Arroyo toads (*Anaxyrus californicus*).
10. Can the project be used for leverage for other funding/actions/benefits?
Yes, the project can be used to leverage other funding sources for non-native plant control projects in the San Luis Rey Watershed.
11. Does the project provide a cost-effective means of attaining water quality goals?
Yes, the project provides a cost-effective means of attaining water quality goals as the District has fine tuned its treatment methods and uses a "top down" approach to non-native plant control treatment to ensure that upper reaches of the watershed are treated first, thus limiting the probability of re-infestation from upstream reaches.
12. Does the project integrate outreach and education to targeted audiences?
The program directly interfaces with property owners that have *Arundo* on their property. This involves maintaining over 350 ROEs Most tributaries to the San Luis Rey are nearly 100% privately owned including: Ostrich, Live Oak, Keys, Castle, Moosa, and Olive Hill Creeks. Large portions of the San Luis Rey River are also privately owned. Public and conservancy lands on San Luis Rey a are also part of the program and are treated. The Mission RCD program participates in local and State meetings including: Weed Management Area meetings and Cal-IPC symposiums. Mission RCD also holds and attends many public events where information about the watershed control program and the funding entities is shared and publicized.

Work Plan containing tasks and deliverables compartmentalized into partial funding opportunities, if applicable.

The project uses only one method for *Arundo* re-treatments - foliar application of aquatic approved formulations of glyphosate (Aquamaster or Rodeo). This is a targeted application using backpack sprayers in the fall when efficacy is highest. Greater than 90% of the *Arundo* leaf area is treated, an aquatic approved surfactant is used to improve spreading and adhesion of the spray, and a dye is used to assist in assuring adequate coverage and to make sure drift/non-target application is not occurring. This method has been fine tuned over the past 15 years to assure the highest effectiveness and minimize impacts to non-target species. It is important not to cut the *Arundo* prior to spraying as this drastically reduces treatment effectiveness. *Arundo* is very difficult to kill- hence the need for ongoing re-treatments in past project areas. It is important to note that initial work was on well established stands of *Arundo* with large reservoirs of energy stored in their rhizome mats (over 40 canes per m^2, stands sometimes over 10 acres in size). The number of canes drops every year with re-treatment but it takes persistent re-treatment over every mile and every patch of treated *Arundo* to achieve 100% success. The watershed control program is also a 'big' program, with major projects ending about every three years. This has generated 'new' re-treatment areas (1 to 5 miles of river and streams per completed project). The goal is to have no canes per mile- and it takes 15 to 20 years to achieve that from the initial treatment date. Permits are held that specifically allow minor trimming of natives if needed to assure un-cut *Arundo* is treated and native vegetation is not sprayed. Trimming of natives is minor and they quickly regenerate within the next spring growing season. Permits held by CDFW,

USFWS, and ACOE all outline measures that protect habitat and water resources. All work occurs between September 15th and March 15th, with most occurring in the fall. This avoids impacts as crews are working when listed species are either not present (migratory: least Bell's vireo, southwestern willow flycatcher) or not active/dormant (arroyo toad, *Ambrosia pumila*). *Arundo* re-treatment occurs on over 20 miles of creeks and rivers each year on the San Luis Rey Watersheds. This has been about 4,500 treatment points per year based on past EMP work, but the number is dropping.

The treatment of non-native woody vegetation also uses application of aquatic approved formulations of glyphosate (Aquamaster or Rodeo), as necessary, but may use other formulations when appropriate. Dependent upon the species, size, and location, application may be by foliar treatment, cut-stump, or via the drill and kill method. Biomass of woody vegetation will be reduced in areas that are prone to fire, near habitable structures, or along roadways and corridors where the public may perceive dead vegetation as aesthetically unpleasing.

Deliverables for the project include photographs of treatment areas, GPS locations of treatment points, and maps of treatment areas and biomass reduction locations.

The project may be broken down in to partial funding areas by funding one or more of the following tasks:

Task No.	Task	Amount	Units	Rate	Cost
1	**Re-treatments of *Arundo donax***				
1.1	Re-treatments of *Arundo donax*	3	Years	$40,000.00	$120,000.00
1.2	Biological Supervision, Permit Compliance, Monitoring	400	Hours	$45.00	$18,000.00
1.3	Right of Entry Agreements	300	Hours	$45.00	$13,500.00
1.4	Contracting, RFP	50	Hours	$45.00	$2,250.00
1.5	Yearly Reporting to Regulatory Agencies	150	Hours	$45.00	$6,750.00
1.5	Quarterly & Final Reporting	230	Hours	$45.00	$10,350.00
	Task Total				**$170,850.00**
2	**Non-native Woody Species Treatment**				
2.1	Initial Treatment of Woody Species	15	Acres	$7,000.00	$105,000.00
2.2	Re-treatment of Woody Species	2	Years	$20,000.00	$40,000.00
2.3	Biomass Reduction	10	Acres	$12,000.00	$120,000.00
2.4	Biological Supervision, Permit Compliance, Monitoring	400	Hours	$45.00	$18,000.00
2.5	Right of Entry Agreements	300	Hours	$45.00	$13,500.00
2.6	Contracting, RFP	50	Hours	$45.00	$2,250.00
2.7	Yearly Reporting to Regulatory Agencies	150	Hours	$45.00	$6,750.00
2.8	Quarterly & Final Reporting	230	Hours	$45.00	$10,350.00
	Task Total				**$315,850.00**

3	**Non-native Herbaceous Species Treatment**				
3.1	Treatment of Herbaceous Species (pampas grass, yellow flag iris, etc)	5	Acres	$5,000.00	$25,000.00
3.2	Biological Supervision, Permit Compliance, Monitoring	150	Hours	$45.00	$6,750.00
3.3	Right of Entry Agreements	100	Hours	$45.00	$4,500.00
3.4	Contracting, RFP	50	Hours	$45.00	$2,250.00
3.4	Yearly Reporting to Regulatory Agencies	100	Hours	$45.00	$4,500.00
3.6	Quarterly & Final Reporting	150	Hours	$45.00	$6,750.00
	Task Total				**$49,750.00**

Note that, when the project is compartmentalized in to partial funding sources, each task requires a component of the overall project that cannot be evenly split (i.e. contracting, permit compliance); therefore, the total budget for separating the project exceeds the overall budget for a fully funded project.

Timeline (from funding approval) with milestones and end dates.

Task No.	Task	Year 1	Year 2	Year 3
1	**Non-native Species Treatments**			
1.1	Re-treatments of *Arundo donax*			
1.2	Re-treatments of woody species			
1.3	New woody species treatments			
1.4	New herbaceous treatments			
2	**Biomass Reduction**			
2.1	Woody species reduction			
3	**Monitoring**			
3.1	Biological Supervision, Permit Compliance, Monitoring			
3.2	Right of Entry Agreements			
4	**Contract Management**			
4.1	Contracting, RFP			
4.2	Yearly Reporting to Regulatory Agencies			
4.3	Quarterly & Final Reporting			

Budget broken down into tasks.

Task No.	Task	Amount	Units	Rate	Cost
1	**Non-native Species Treatments**				
1.1	Re-treatments of *Arundo donax*	3	Years	$40,000.00	$120,000.00
1.2	Re-treatments of woody species	2	Years	$20,000.00	$40,000.00
1.3	New woody species treatments	15	Acres	$7,000.00	$105,000.00
1.4	New herbaceous treatments	5	Acres	$5,000.00	$25,000.00
	Task Total				**$290,000.00**
2	**Biomass Reduction**				
2.1	Woody species reduction	10	Acres	$12,000.00	$120,000.00
	Task Total				**$120,000.00**
3	**Monitoring**				
3.1	Biological Supervision, Permit Compliance, Monitoring	400	Hours	$45.00	$18,000.00
3.2	Right of Entry Agreements	300	Hours	$45.00	$13,500.00
	Task Total				**$31,500.00**
4	**Contract Management**				
4.1	Contracting, RFP	50	Hours	$45.00	$2,250.00
4.2	Yearly Reporting to Regulatory Agencies	150	Hours	$45.00	$6,750.00
4.3	Quarterly & Final Reporting	230	Hours	$45.00	$10,350.00
	Task Total				**$19,350.00**
			Project Total		**$460,850.00**

Discuss all permitting requirements, including CEQA, and their status. If exempt, cite applicable statute.

The District has spent a great deal of time working with regulators on streamlining the permitting process for its invasive species control programs. This coordination has been beneficial to both the regulators and the District. The District holds all permits necessary to complete the project, including:

- California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (SAA) number 2014-0011-R5 (San Luis Rey Watershed)
- US Army Corps of Engineers Regional General Permit #41 (RGP41) permit number SPL-2003-01094-CLH; File Number: 200401532-RRS; Verification Letter Number SPL-2012-00357-MLM
- US Fish & Wildlife Service Section 7 Consultation and Biological Opinion (BO) number FWS-SDG-1034.4; US Army Corps of Engineers Letter or Concurrence Number FWS-SDG-1034.4

Watershed(s) affected.

This project affects the San Luis Rey Watershed. Work occurring under the project promotes the restoration of aquatic ecosystems in the San Diego Region and furthers the recovery of streams, wetlands, and riparian systems.

Describe if this project can be a basis from additional funding from other sources.

This project may help leverage other funding sources for the continuance of non-native plant control within the San Luis Rey Watershed. The District is continually seeking funding from local, state and federal sources to further its work on habitat restoration and the removal and eradication of non-native species

Monitoring, success criteria, and other tools to track long-term success.

All treated non-native vegetation is GPSed by the crews as they treat. This is the only efficient way to track the scattered plants that are distributed across treatment areas. This is building a valuable dataset that tracks locations of *Arundo,* as well as documenting progress over time. Photos are also taken during the work cycle for reporting. These point datasets compliment the initial polygon based GIS mapping that occurred prior to initial treatment work. Current mapping/GIS work is catered to project goals and needs: 1) tracking re-treatment progress over time, 2) documenting extent of work, and 3) assisting in assessment of which ROEs need to maintained to carryout re-treatments (the program does not want to spend resources maintaining ROEs that it no longer needs). The contractors that carry out the re-treatments GPS *Arundo* points as they go. Mission RCD compiles GIS data, carries out analyses, and generates maps and reports.

Description of how the project is resilient to climate change.

The Project will help offset and reduce impacts from climate change, particularly scenarios where the systems are becoming drier and hotter. Removal of non-native vegetation will help address water shortages by reducing water consumption by vegetation). Less *Arundo* equals a water savings for the rivers, making what rainfall and baseline flows occur last longer and reach further downstream. Climatic change is also resulting in drier and hotter conditions that are increasing the frequency and intensity of fires in the region. Several large scale upland wildfires have occurred in the past 10 years in San Diego County. These fires have burned portions of the river systems. Fires started in *Arundo* and tamarisk dense areas are documented as occurring in both the San Luis Rey Watershed (six fires in seven years, 103 riparian acres burned, Cal-IPC 2011).

Drought conditions, resulting from climate change, are forcing all of the river systems to be more closely monitored and potentially regulated for groundwater resources. This is demonstrated by the d developing groundwater management programs on the San Luis Rey (Rainbow MWD, Fallbrook PUD, and Oceanside) watershed.

Currently, the presence of *Arundo* and other non-native woody vegetation exacerbates the impacts of drought on fauna by offering little food and poor shelter resources and directly competing with native species for scarce resources (water). Removal of non-native vegetation will help mitigate these stresses, giving species greater ability to adapt, persist and move both within the habitat as well as to link key habitat areas. Removal will also help normalize abiotic processes (flooding, geomorphic processes, and

water availability) by restoring function that has been heavily degraded by the presence of non-native vegetation, potentially contributing system resilience to climate-change induced intense rainfall events. It will also reduce the likelihood of fire occurring in the system, an *Arundo* driven impact that has severely impacted coastal watersheds. Climatic change may bring more dynamic water patterns, such as extreme drought followed by intense floods. Removing non-native vegetation will help the river systems cope with these changes and increased variability.

Applicants ability/authority to receive and distribute funds.

Under Division 9 of the State of California Public Resources Code, Resource Conservation Districts are authorized to receive and administer funds for work they are allowed to undertake, including but not limited to watershed projects.

The District has successfully managed and completed, and continues to manage, grants and funds from a wide variety of funding sources, including the Water Board. Other funding sources including the San Diego County Water Authority, County of San Diego, San Diego Integrated Regional Water Management, Wildlife Conservation Board, US Bureau of Reclamation, USDA Natural Resources Conservation Service, California Department of Fish & Wildlife, San Diego Association of Governments TransNet Environmental Mitigation Program, among others.

The District has a consistent and proven track record of successfully utilizing program funds for their specified purposes both on time and on budget. The District is continually seeking funding to further its mission and goals and ensure that the projects undertaken are sustainable and provides lasting results that benefit the community and watershed health. The District has been operating since its conception in 1944 and maintains highly qualified staff members that have the capacity to complete the project, including the ability to accomplish the work and provide the products and reports expected under this application.

Is the project to conduct work that is required by any entity/agency? (e.g. cleanup or mitigation)

No, this project will not conduct work that is required by any entity or agency.